TOUCH THE FUTURE

AUTOMATIC IDENTIFICATION

by

DALLAS SEMICONDUCTOR

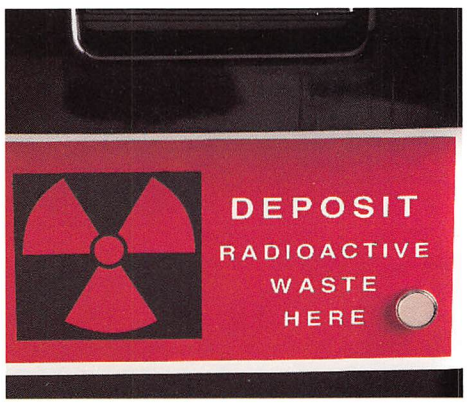
We've Got the Touch

A new, coin-shaped data carrier from Dallas Semiconductor transfers records simply, with a touch. Information stored in the DS199x Touch Memory is read by a computer with a momentary contact; the chip is programmed in the same way. When used as a silicon label, it surpasses ink-on-paper counterparts in greater data capacity, alterability, and stainless steel durability.

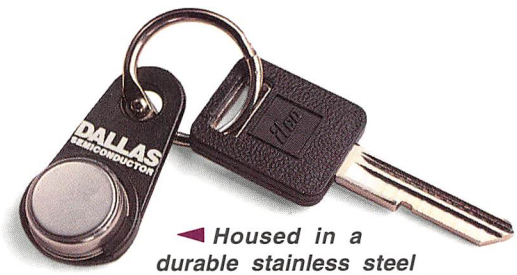
A significant obstacle to overcome in turning a chip into a new kind of label is attachment. To date, chips haven't attached to much of anything besides printed circuit boards. Available with adhesive backing, Touch Memories attach to virtually anything to give quick, positive ID.

The Touch Memory is a chip-based label with adhesive backing that attaches to virtually anything. Until now, there was no practical way to attach chips to objects other than printed circuit boards.

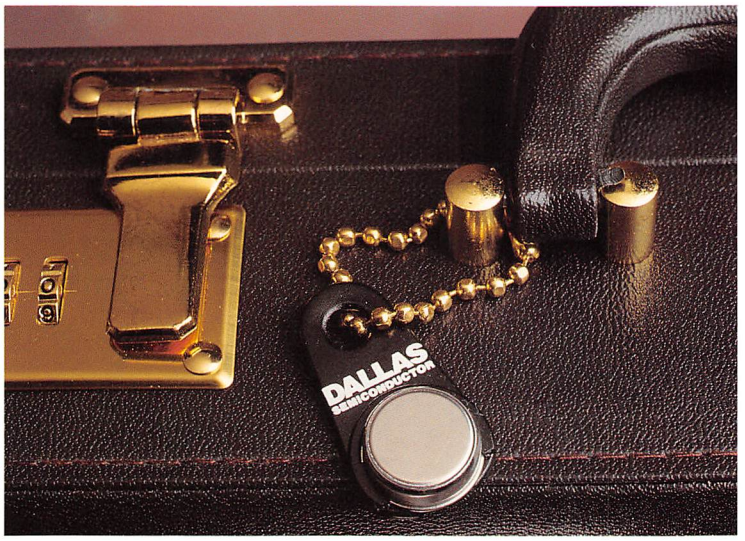
A Touch Memory on a hospital bracelet provides the patient's ID number. The number and test data results are transferred to an inexpensive hand-held instrument, like a temperature, blood pressure, or glucose meter. This alleviates the need for manual keystrokes and the associated errors.



Touch Memory enhances the productivity of hands-on workers by eliminating the need for paperwork or keystrokes. Information about this waste can's contents, who it was issued to, its location, and the date it was last decontaminated can be stored electronically.



Housed in a durable stainless steel enclosure, the Touch Memory uses digital signals to activate electric locks, providing convenient, secure access to buildings.



A silicon, self-stick note, Touch Memory carries up-to-date information, including variable data that tracks the contents of this locked case, its destination, and who handled it last.

This employee badge uses Touch technology to provide access to restricted areas at minimum cost.

The Touch Memory's circular rim guides a reader for quick, forgiving alignment.

Touch and Proximity technologies track work trays as they move through the manufacturing plant, recording each operation performed on the parts.

ID by Touch

The Touch Memory is a nonvolatile memory chip packaged in a rugged, stainless steel can. A silicon self-stick note, the Touch Memory attaches data to the object for instant accessibility.

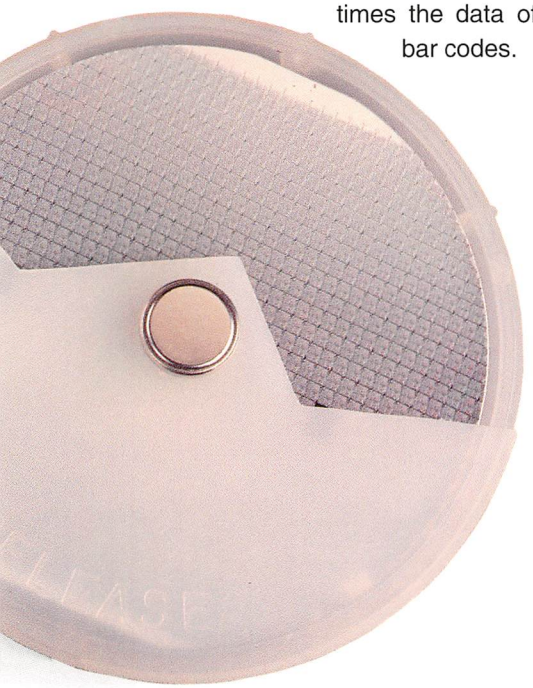
Silicon Media

Compared to read-only bar codes, Touch Memories can be read and written. Whereas bar codes have a fixed identity, Touch Memories are dynamic: they hold up-to-date, relevant information, made possible because the chips can be reprogrammed while attached.

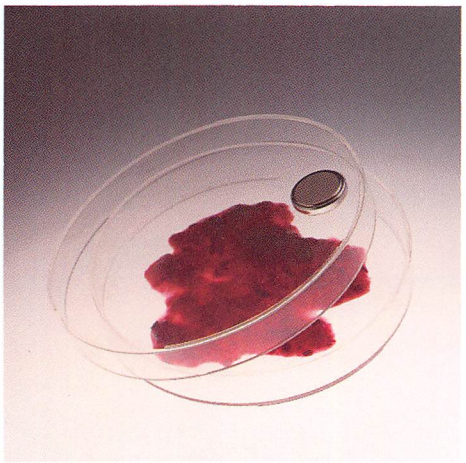
Designed for change, the Touch Memory creates a flexible network that provides on-the-spot information about when and where a product was made, machine setup data, who worked on the product last, and what quality checks were passed. As a product moves through various work stations during the manufacturing process, the chip can record each step.

Perhaps the most obvious benefit silicon has over paper is *no paper!* It relieves that burden of paperwork associated with record keeping and does away with the need for manual computer entry and the associated keystroke errors.

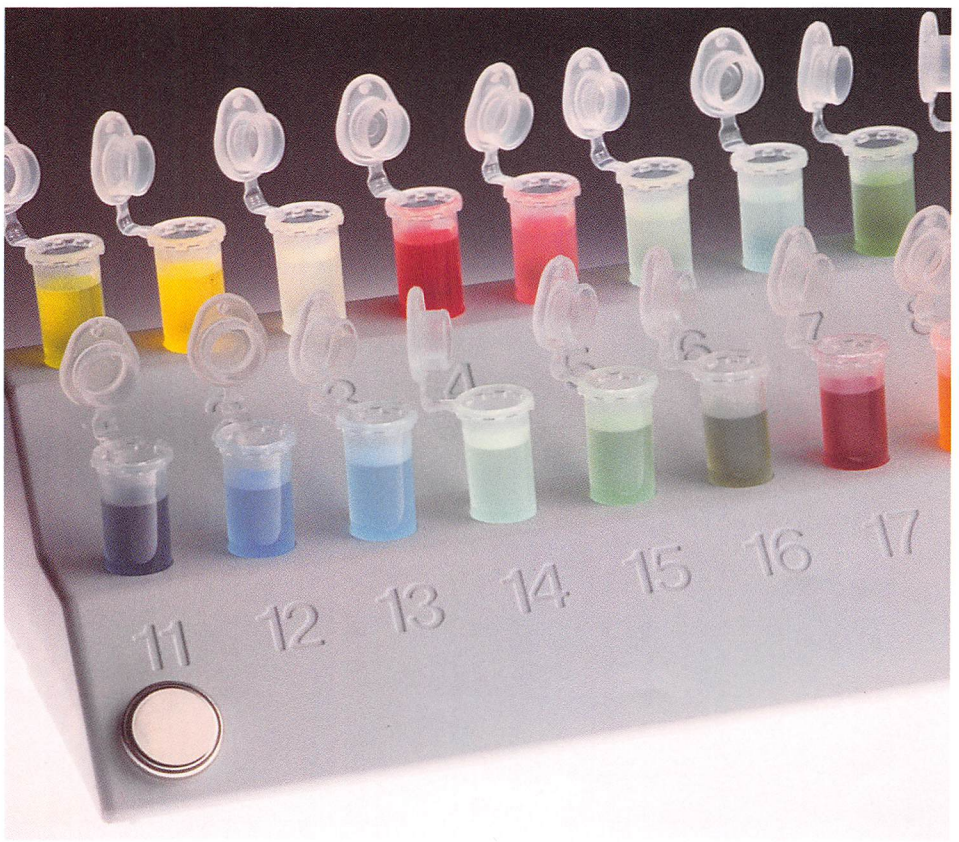
Silicon can be read directly by a computer, without supplemental optical equipment. Available in densities of 4K bits and more, Touch Memory records over 100 times the data of bar codes.



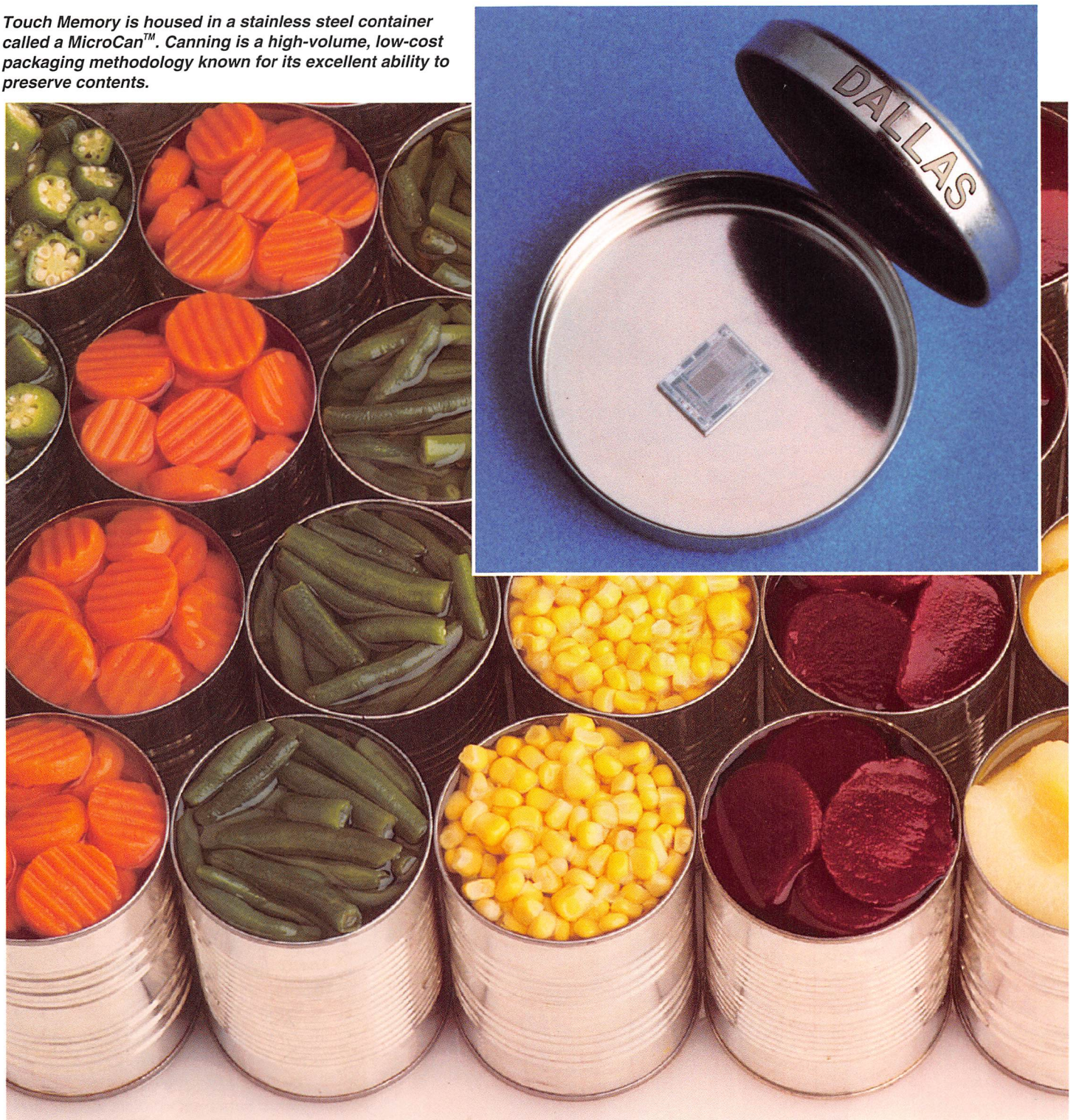
"A rounded spherical shape. . .has the greatest degree of completeness and uniformity."
—Plato, *Timaeus*, 384 B.C.



Touch Memories are available with adhesive backing to attach to virtually anything. These data carriers move up-to-date information with the object to form a very flexible network without wiring.



Touch Memory is housed in a stainless steel container called a MicroCan™. Canning is a high-volume, low-cost packaging methodology known for its excellent ability to preserve contents.



Chip-in-a-Can

Touch Memory's coin shape is a familiar one, which provides for easy handling. The curved edges guide a probe for quick alignment in a process similar to placing a cap on the rim of a bottle.

Called a MicroCan™, the stainless steel enclosure is a miniature can with a sealed lid. This rugged and durable container preserves the chip even when subjected to corrosive conditions. The Touch Memory benefits from the high-volume, low-cost packaging methodology of canning.

Talking Through the Lid

In addition to serving as a protective housing, the MicroCan's metallic surface serves as the point of electrical contact — the chip communicates through the lid. This large, round contact is an easy target.

In contrast to a typical integrated circuit, Touch Memory reduces all signalling to a single surface. The bond pad on the chip extends to the can's lid; the rim and bottom become ground.

Data Integrity

When contacted, the Touch Memory emits a door knock-like signal, followed by its family code, a unique 48-bit serial number, and a CRC (Cyclic Redundancy Check) code. Written by a laser, the serial numbers are unalterable. The CRC code validates the serial number and qualifies the electrical connection.

The internal scratchpad area prevents inadvertent writing over existing data, or writing to the wrong location. Data is first written to the scratchpad and then verified before it is transferred to memory. Once the transfer is initiated, a copy of the scratchpad is faithfully reproduced in memory even if the contact is broken.

Secure versions of Touch Memory require 64-bit passwords to be entered before data is transferred.

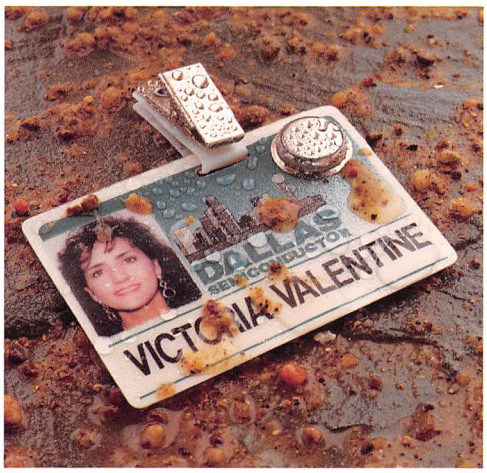
Touch Readers

The Touch Memory is read by an inexpensive probe, such as the DS9092 Touch Memory Probe, which consists of two stamped metal pieces separated by an insulator. The recessed center of the probe is data; the rim guide is ground.

Because the probe is small, it can be integrated into hand-held instruments or terminals to directly transfer the record. A spare I/O line of a microcontroller is all that is required to read or write a Touch Memory through the probe contact. Alternatively, any PC can be quickly retrofit to read Touch Memories by plugging Dallas Semiconductor's DS9097 Adaptor, with a DB-25 connector, into the serial port. The DS9097 has provisions for the probe to be extended from the back of the computer.

This Keytronics keyboard features a Touch Probe. The keyboard converts data read from a Touch Memory to keystrokes or bar code formats so that the information system expecting bar codes need not be modified.

The Touch Probe on this portable terminal reads and writes chips while they are still attached.

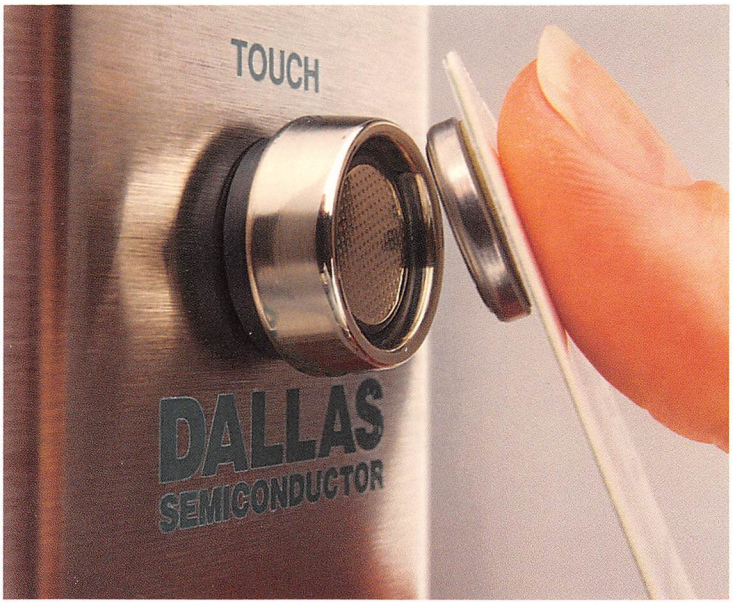


Because of their stainless steel composition, the chip and reader resist corrosion. Bright, smooth surfaces easily wipe clean.

The Touch Memory Probe can be incorporated in a variety of readers.

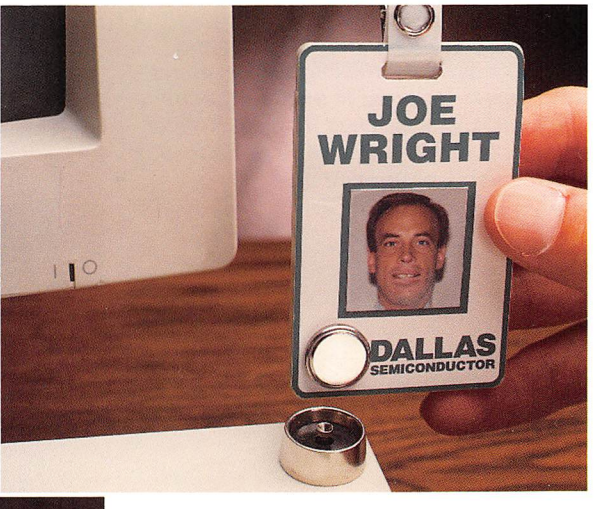
Psion's Organiser II can display data on the screen and write new information to Touch Memories in an instant.

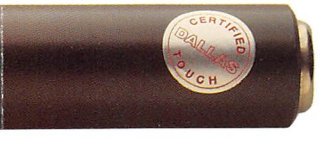
The Touch Pen provides a simple way to gather data from multiple, dispersed Touch Memories for downloading to a central computer.



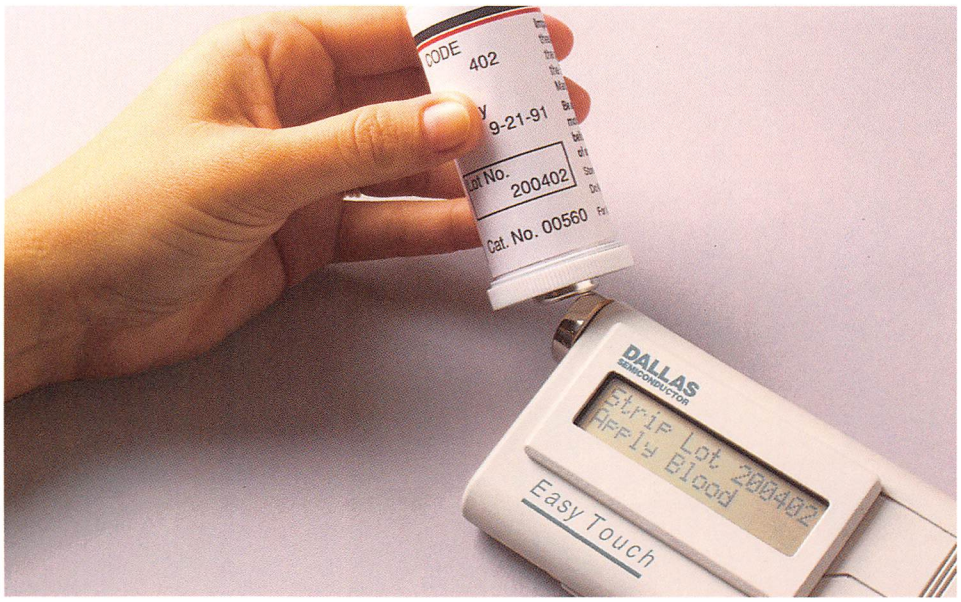
Touch technology provides convenient yet secure access to restricted areas. The employee simply touches the badge to the Touch Probe to gain access to the secured area. The transaction is logged automatically. Unlike traditional keys, Touch Memories needn't be precisely aligned and inserted.

The employee gains access to sensitive data by touching his badge to a contact probe on the PC keyboard.

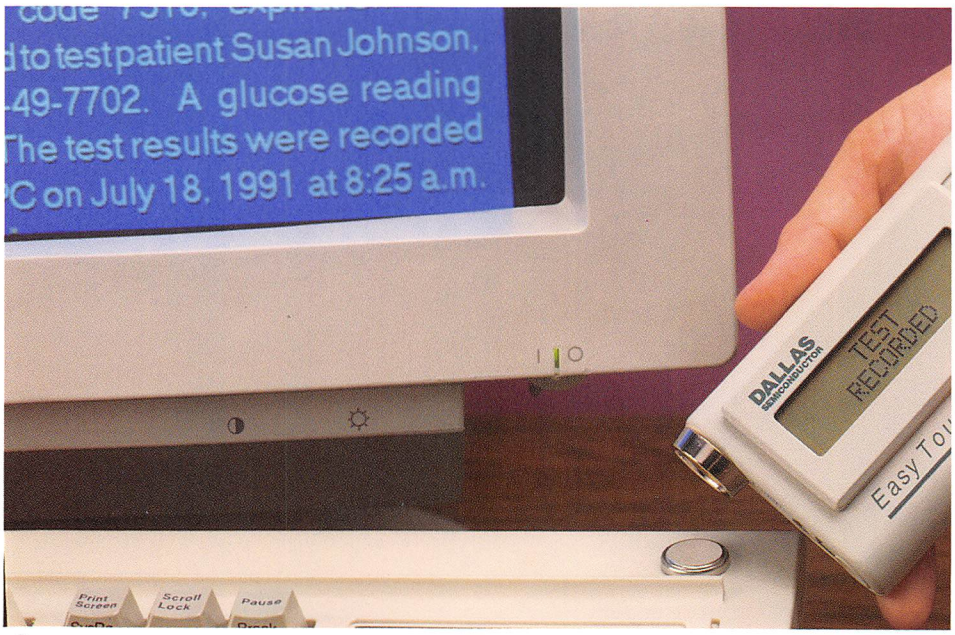




A hand-held instrument can be designed without the confusion of operator buttons. The instruction manual for the meter simply reads, "Please Touch." Here, a buttonless hand-held test meter identifies the nurse and keeps quality control records, ensuring that the instrument is used correctly.



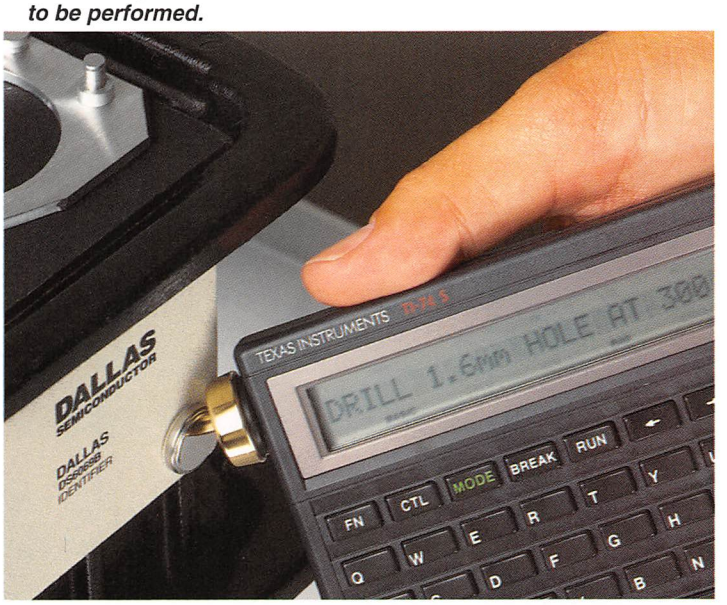
A Touch Memory affixed to the reagent canister holds specific information about this reagent. In order to insure accurate test results, it is touched to the test meter to indicate which test is to be performed and to supply calibration data.



After the test is performed, the results are archived into a PC by touching the meter to a contact similar to a Touch Memory that is wired internally to the keyboard. Throughout this process, information is logged automatically to increase the productivity of the hospital worker.

Attached to a work tray, Touch Memory logs each step performed on the work pieces as they travel through the factory.

When the chip is touched by a hand-held terminal, information in the Touch Memory is transferred to give the machine operator directions on the task to be performed.



The hand-held touches the machine tool, transferring the setup instructions from the chip. For example, it sets the drill press to the speed at which it is to perform the bore.

The operator touches his employee ID badge to the hand-held when the process is completed, logging who performed the task.

Touch Starter Kit DS9092K

Touch Memory PC Serial Port Adaptor DS9097

TOUCH PRODUCT FAMILY
A. DS9092T Touch Memory Probe with Tactile Feedback B. DS9092 Touch Memory Probe
C. DS199x-R3 Touch Memories D. DS9094 Touch Memory Clip E. DS9092G Handgrip Probe
F. DS1992 Touch Memory G. DS1991 Touch Memory
H. DS1993 Touch Memory I. DS1990 Touch Memory
J. DS9093F Touch Memory KeyRing Mount
K. DS9093 Touch Memory KeyRing Mount
L. DS9096 Touch Memory Self-Stick Tape

Touch Memory Family

	1-Wire Compatible	48-Bit Unique Identification	Read/Write Memory Size (Bits)	Secure Memory	Real-Time Clock	Maximum Data Rate	Package Style	Stainless Steel
DS1990	Y	Y	0	N	N	16 kbps	R	Y
DS1991	Y	Y	1,152	Y	N	16 kbps	R/F	Y
DS1992	Y	Y	1,024	N	N	16 kbps	R/F	Y
DS1993	Y	Y	4,096	N	N	16 kbps	R/F	Y
DS1994	Y	Y	4,096	Y	Y	16 kbps	R/F	Y

Package Style: R = Rounded rim MicroCan
F = Flanged rim MicroCan

Take a Test Drive

For marketing and technical assistance, call the Touch Memory Hotline at (214) 450-3731.

To evaluate Dallas automatic ID technology, call (214) 450-3806 and order the DS9092K Touch Starter Kit. All you need is a Visa, MasterCard, or American Express. Orders placed before 3:30 p.m. Central time will be shipped the next working day.

If you find the kit does not suit your needs, simply return it within 30 days and receive a full refund of the purchase price.

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